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THE GENUS *MIAGRAMMOPES* (ARANEAE, ULOBORIDAE) IN PANAMA AND THE WEST INDIES

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The collection of members of this genus of spiders has been of interest to me for many years. As a result, I have accumulated a considerable number of specimens of both sexes from Panama and the West Indies. This seems to be a convenient time to bring together the results of this field work extending over a period of more than thirty-five years.

Up to the present time, so far as I have been able to determine, only one species of the genus has been definitely known from Panama. Mr. Banks (1929) reported the collection of *M. alboguttatus* O. P. – Cambridge on Barro Colorado Island, Canal Zone, but the specimens so identified plainly belong to *M. sinus* Chamberlin and Ivie, 1936. At present I am obliged to recognize six species of this genus from Panama. Among these are four kinds of males and four kinds of females. Although it is difficult to match males and females, I seem to be able to do this for two of the species, but four species will remain known only from a single sex until the genus can be studied more intensively.

In the West Indies, up to the present time, four species belonging to this genus have been definitely recorded. Franganillo reported *M. thwaitesii* O. P. – Cambridge from Cuba in 1936 and earlier but this identification has been shown to have been an error. For this reason this species, described originally from Ceylon, will not be further considered in this paper. At the present time I am obliged to recognize a total of nine species from the West Indies. Five are described as new to science; three of these are known only from males and the remaining two only from females.

All types, together with my entire collection of this genus, are being deposited in the Museum of Comparative Zoology, Harvard University.

Grant No GB-1801 from the National Science Foundation made it possible for me to spend seven months collecting spiders in the West Indies and Panama during the latter part of 1963 and the first five months of 1964. Grant GB-5013 from the NSF made it possible for me to spend nearly four months during 1966 collecting on nine different West Indian islands. During this time, however, I did not take a single mature specimen of *Miagrammopes*. As I have frequently stated in my published papers, I am deeply grateful for financial help from several foundations, together with help and encouragement from members of the staff of the Museum of Comparative Zoology at Harvard University over a period of many years. Special acknowledgements should be extended to Dr. Ernst Mayr, Director; Dr. P. J. Darlington, Jr., Alexander Agassiz Professor of Zoology; Dr. Herbert W. Levi, Associate Curator of Arachnology; Miss Nelda Wright, Editor of Publications; and Dr. Frank M. Carpenter, Alexander Agassiz Professor of Zoology and Editor of Psyche. My thanks are extended to Dr. G. Owen Evans and Mr. D. J. Clark, British Museum (Natural History), for the loan of very helpful specimens of *M. scoparius* Simon.

Genus *MIAGRAMMOPES* O. P. – Cambridge, 1870

The type species of the genus is *Miagrammopes thwaitesii* O. P. – Cambridge, 1870. The holotype is a female and is now definitely known only from Ceylon and, possibly, from India. The male remains unknown. Apparently, the P. – Cambridges had only females for the nine species described by them. The genus is now known to be widely distributed in Asia, Africa, Australia, and especially in the Neotropical region. Roewer, 1954, lists twenty-one species from the Neotropical region. Twelve of these are known only from females, two only from males, six from both sexes, and one from an immature specimen.

In addition to the general family characteristics, generic features common to the species from Panama and the West Indies, studied in the preparation of this paper, may be stated as follows: Cephalothorax in general rather low; carapace often with marked grooves and pits in the cephalic area; sternum often conspicuously subdivided and laterally extended between second and third coxae. Eyes: small; only four in number; with laterals on more or less prominent tubercles. Chelicerae of modest size, probably typically with few true teeth but with cusps and associated long hairs or bristles along margins of fang groove. Legs: 1423 in order of length

with first legs very long and quite robust; in females the first metatarsi and, to some extent, the first tibiae bear conspicuous fringes of hair; in males the first tibiae have more or less prominent batteries of robust spines; in females the fourth metatarsi and tarsi bear robust spines; the calamistrum in females extends from two-thirds to three-quarters of entire length of fourth metatarsi; in both sexes the femora appear to be well supplied with long trichobothria. In females the palpal tarsal claw is conspicuously toothed; in males the palpi are short and simple, with exception of the tarsus, which is moderately complicated. In females the abdomen is usually more or less swollen dorsally; the epigynum is often obscurely patterned.

The complete list of species of the genus *Miagrammopes* from Panama, as they are now recognized, may be given as follows: *Miagrammopes aspinatus* sp. nov.; *M. intempus* sp. nov.; *M. larundus* sp. nov.; *M. licinus* sp. nov.; *M. simus* Chamberlin and Ivie; *M. unipus* sp. nov. The complete list of species of this genus from the West Indies, as they are now recognized, may be given as follows: *M. animotus* sp. nov. from Puerto Rico; *M. ciliatus* Petrunkevitch from St. Thomas and, possibly, also from Puerto Rico; *M. cubanus* Banks from Cuba; *M. latens* Bryant from Cuba and Dominican Republic; *M. molitus* sp. nov. from Jamaica; *M. oblucus* sp. nov. from Jamaica; *M. pinopus* sp. nov. from St. John; *M. scoparius* Simon from St. Vincent; *M. tonatus* sp. nov. from Jamaica.

*Key to the males of known species of MIAGRAMMOPES from
Panama and the West Indies*

- | | |
|--|---------------------|
| 1a. Species in which the carapace is nearly or quite as wide as long (<i>aspinatus</i> , <i>simus</i> , <i>unipus</i>) | 2 |
| 1b. Species in which the carapace is clearly longer than wide (<i>animotus</i> , <i>latens</i> , <i>licinus</i> , <i>molitus</i> , <i>scoparius</i> , <i>tonatus</i>) | 4 |
| 2a. Palpal tarsus with three prominent, terminal apophyses (Fig. 10) | <i>M. aspinatus</i> |
| 2b. Palpal tarsus lacking the three prominent terminal apophyses (<i>simus</i> , <i>unipus</i>) | 3 |
| 3a. First tibia armed with a battery of about 21-22 robust, erect spines extending nearly the entire length of the segment (Fig. 43). <i>M. simus</i> | |
| 3b. First tibia with fewer and weaker spines extending through about the distal two-thirds of the segment (Fig. 50) | <i>M. unipus</i> |
| 4a. Carapace about twice as wide at level of lateral eyes as at posterior end where is it squarely truncate (Fig. 24) | <i>M. molitus</i> |
| 4b. Carapace less than twice as wide at level of lateral eyes as at posterior end (<i>animotus</i> , <i>latens</i> , <i>licinus</i> , <i>scoparius</i> , <i>tonatus</i>) | 5 |
| 5a. Palpal tibia concave dorsally; first tibia with very few spines as seen in retrolateral view (Figs. 20-23) | <i>M. licinus</i> |

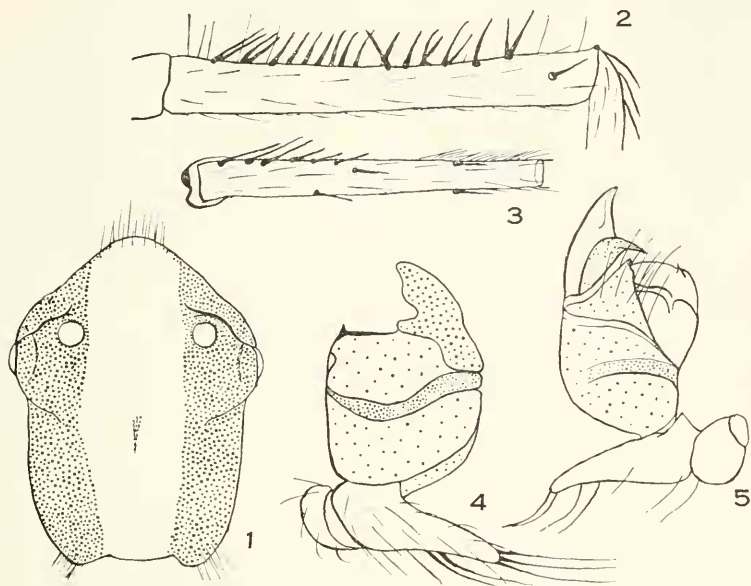
- 5b. Species lacking such a combination of features as given above (*animotus*, *latens*, *scoparius*, *tonatus*) 6
- 6a. Carapace nearly rectangular in outline in posterior two-thirds; first tibia with few long spines showing in retrolateral view (Figs. 45, 46) *M. tonatus*
- 6b. Species without combination of features given above (*animotus*, *latens*, *scoparius*) 7
- 7a. Carapace with a broad, white, median stripe throughout; palpal tarsus with a pair of robust, distal apophyses; first tibia with numerous dorsal spines (Figs. 1, 2, 5) *M. animotus*
- 7b. Species lacking such a combination of features as given above (*latens*, *scoparius*) 8
- 8a. Palpal tarsus terminating in a single robust apophysis together with a series of small, sharply pointed spines (Bryant, 1936, fig. 4) *M. latens*
- 8b. Palpal tarsus with a distal apophysis divided into a robust hook and a slender, sickle-shaped extension (Fig. 36) *M. scoparius*

MIAGRAMMOPES ANIMOTUS sp. nov.

Figures 1-5

Holotype. The male is from Mayaguez, Puerto Rico, W. I., in a wooded area near Nuclear Center, January 27, 1964. The name of the species is an arbitrary combination of letters.

Description. Total length from anterior border of carapace to posterior end of spinnerets about 2.8 mm (body curled). Carapace 0.97 mm long; 0.71 mm wide at level of lateral ocular tubercles where it is widest; with little hair; only a slight depression to represent the median thoracic fovea; grooves and depressions in ocular region, so conspicuous in some species, only slightly developed here; lateral ocular tubercles also weakly developed (Fig. 1). Eyes: only four, in a gently recurved row as seen from above; ratio of eyes ME : LE = about 6 : 7; ME separated from one another by about 4.6 times their diameter, from LE by a little less than three times their diameter; with very little black pigment in ocular region. Chelicerae, maxillae, and lip difficult to observe closely but apparently typical of males of the genus. Sternum: very much swollen in middle and greatly expanded between second and third coxae; in general, typical of males of the genus. Legs: tibial index of first leg 12, of fourth leg 10; first leg with a conspicuous battery of stout spines on tibia and metatarsus (Figs. 2-3); first leg somewhat more than twice as long as second leg and a little more than three times as long as third leg. Calamistrum lacking. Palp: essential features



Figures 1-5. *Miagrammopes animotus* sp. nov. Fig. 1. Carapace; from above. Fig. 2. Right first tibia; retrolateral view. Fig. 3. Right first metatarsus; dorsal view (several spines restored from scars). Figs. 4-5. Male palpus; retrolateral and prolateral views, respectively.

shown in Figures 4-5. Abdomen without special features; apparently quite typical of males of the genus. Color in alcohol: carapace with a broad, median, white stripe covering the median third from clypeus to posterior border; lateral thirds of the carapace brownish gray with black, irregular, short lines; sternum yellowish with irregular grayish spots; legs generally yellowish but first legs are brown dorsally; abdomen with nearly the whole dorsum light yellowish with white flecks; a pair of minute black dots occurs on the dorsum a little in front of the middle and another pair of black dots occurs a little behind the middle of the dorsum; a black, lateral stripe on each side extends the whole length of the abdomen; the central part of the venter is very light brownish and the remainder is nearly the same but with many whitish flecks.

Records. Two immature specimens taken on the same day as the holotype and in the same locality are tentatively placed in this species, but their identification must remain uncertain.

MIAGRAMMOPES ASPINATUS sp. nov.

Figures 6-10

Holotype. The male is from Barro Colorado Island, Panama Canal Zone, June, 1950. The name of the species is an arbitrary combination of letters.

Description. Total length from anterior border of carapace to posterior end of extended spinnerets about 3.82 mm. Carapace about 1.29 mm long; 1.21 mm wide at level of lateral ocular tubercles where it is widest; about 0.57 mm tall; quite hairy; with moderately well developed median thoracic fovea, pits and grooves in ocular regions and lateral ocular tubercles (Fig. 6). Eyes: only four, as usual in the genus; with the row slightly recurved as seen from above; ratio of eyes ME : LE = 6 : 7.5; ME separated from one another by about nine times their diameter, from LE by about five times their diameter. Chelicerae, maxillae and lip apparently typical of males of the genus but details not clearly observed because of fragility of holotype and closely coiled appendages. Sternum: quite typical in general; quite convex in middle but less so than in some species; much narrowed at posterior end and, apparently, continued by an extra, very narrow sclerite between fourth coxae, which are separated by slightly more than one-fifth of their width. Legs: tibial index of first leg 11, of fourth leg 12; first leg nearly twice as long as second leg; nearly three times as long as third leg; first tibia with a conspicuous battery of robust spines much as in *M. simus* Chamberlin and Ivie; fourth tibia also with numerous long, stout spines (Figs. 7-8). Palp: essential features shown in Figures 9-10; tibia with quite distinctive form. Abdomen: typical of males of the genus. Color in alcohol: yellowish throughout with some variation; only a moderate amount of black pigment in ocular region; abdomen with three pairs of minute dots on dorsum equally spaced from the base; legs with few gray areas.

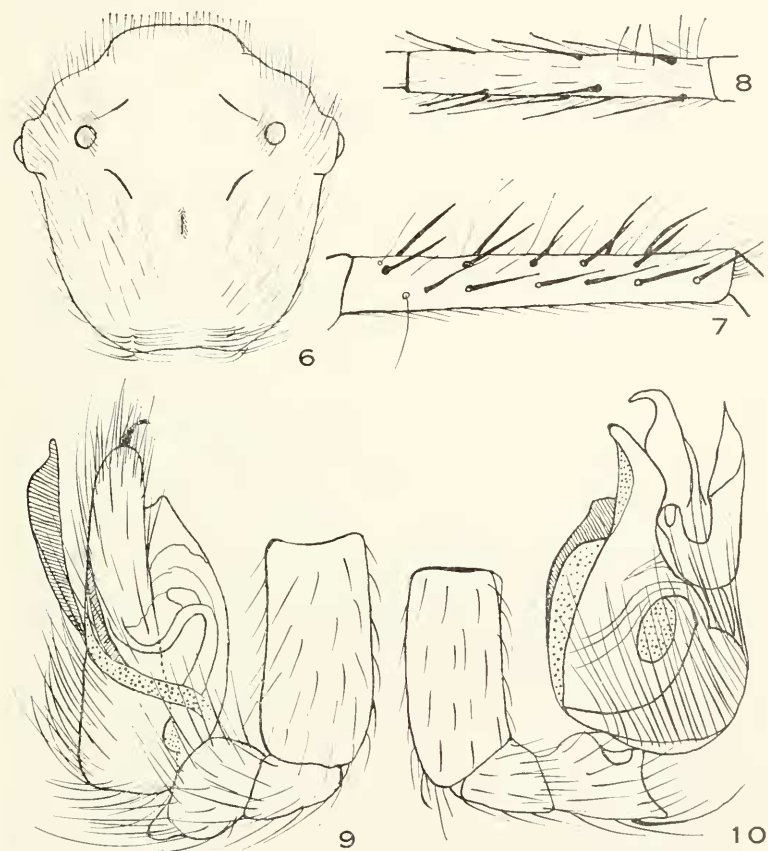
Records. The female is unknown. Another specimen of the genus was taken at the same time and in the same locality as the holotype, but it is immature and its identification is very uncertain.

MIAGRAMMOPES CILIATUS Petrunkevitch

Miagrammopes ciliatus Petrunkevitch, 1926: 47, fig. 7. The present location of the holotype is quite uncertain. Petrunkevitch, 1930: 232; Roewer, 1954: 1349; Bonnet, 1957: 2830.

The holotype of this species was a female from St. Thomas, U. S. Virgin Islands, collected in July, 1915. No description of the epigynum was given. Dr. Petrunkevitch later had several specimens of

what he assumed to be the same species from Puerto Rico. Among these were three females regarded as mature and several immature specimens of both sexes. I think it unlikely that the Puerto Rican specimens belong to *M. ciliatus* Petrunkevitch but I cannot be positive at this time. In my collection from Puerto Rico, made in January and February, 1964, I have a single mature male and several immature specimens but not a single mature female. The mature male is being described as a new species elsewhere in this paper.



Figures 6-10. *Miagrammopes aspinatus* sp. nov. Fig. 6. Carapace; from above. Fig. 7. Right first tibia; dorso-retrolateral view. Fig. 8. Right fourth tibia; prolateral view. Figs. 9-10. Male palp; prolateral and retrolateral views, respectively.

MIAGRAMMOPES CUBANUS Banks

MIagrammopes cubanus Banks, 1909: 159. The holotype is in the Museum of Comparative Zoology. Bryant, 1940: 329; Roewer, 1954: 1349; Bonnet, 1957: 2830.

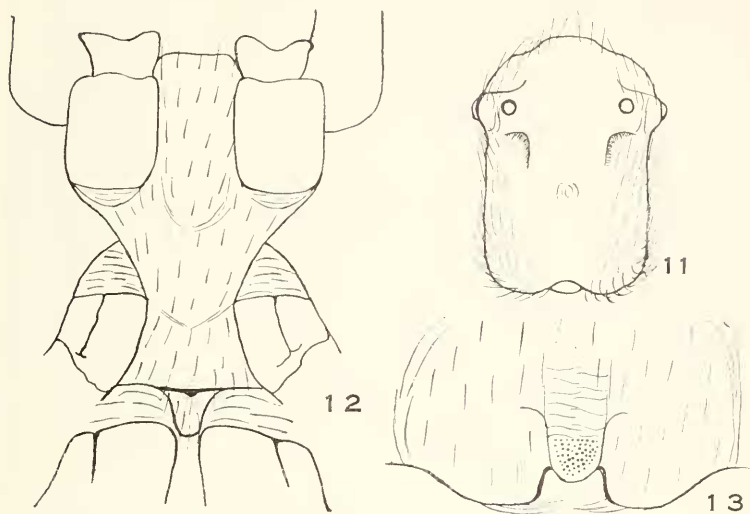
The holotype was very briefly described and no figures were published. The holotype is immature and its status cannot be determined until careful collecting is pursued in the type locality. Miss Bryant (1940) stated that *M. latens* Bryant might prove to be a synonym for *M. cubanus* Banks. A few specimens assigned to *M. cubanus* Banks since the holotype was described are plainly *M. latens* Bryant.

MIAGRAMMOPES INTEMPUS sp. nov.

Figures 11-13

Holotype. The female is from Porto Bello, Panama, August 11, 1936. The name of the species is an arbitrary combination of letters.

Description. Total length from anterior border of porrect chelicerae to posterior end of spinnerets 6.24 mm; length from anterior border of carapace to posterior end of anal tubercle 5.85 mm. Carapace 1.54 mm long; 1.08 mm wide at level of lateral ocular tubercles where it is widest; grooved behind ME in somewhat distinctive manner; with a poorly defined median thoracic fovea (Fig. 11); about 0.55 mm tall; lateral ocular tubercles less prominent than in some other species; with many hairs. Eyes: four as usual, in a slightly recurved row as seen from above; ratio of eyes ME : LE = 6.5 : 8; ME separated from one another by about eight times their diameter, from LE by nearly 3.5 times their diameter. Chelicerae, maxillae and lip apparently quite typical of females of the genus. Sternum: conspicuously distinctive; anterior portion sharply narrowed from median portion which is greatly widened and extended between second and third coxae thus forcing first and second legs forward and third and fourth legs backward; between third and fourth coxae there is a transverse shelf and behind this a greatly depressed and narrowed portion (Fig. 12); in front of third coxae are loose, membranous structures and just behind second coxae are smaller, similar structures; fourth coxae separated by slightly less than one-fourth their width. Legs: tibial index of first leg 13, of fourth leg 10; first leg with copious hair fringes on tibia and metatarsus; first leg nearly twice as long as second leg and about 2.5 times as long as third leg; fourth tibia a little longer than first tibia; second and third coxae very widely



Figures 11-13. *Miagrammopes intempus* sp. nov. Fig. 11. Carapace; dorsal view. Fig. 12. Sternum, seen from below. Fig. 13. Epigynum, seen from below.

separated as already noted; only occasional slender spines on palps and legs with exception of fourth tarsi and metatarsi where special, short, robust spines occur similar to those figured for *M. simus* Chamberlin and Ivie. Black palpal claw quite conspicuous. Calamistrum about three-fourths as long as fourth metatarsus. Abdomen with a conspicuous dorsal hump a little in front of the middle; otherwise apparently quite typical of females of the genus. Epigynum: essentials shown in Figure 13. Color in alcohol: carapace light brownish in general but with many darker streaks; lighter through the center and darker along lateral sides; sternum light yellowish brown; legs brownish in general with first pair darkest on dorsal surfaces and light brownish below; abdomen with a dark median stripe widest in anterior third then narrowed at top of dorsal hump and widened again at posterior end; each side of the central dark stripe there is a lighter, finely reticulated area; these reticulated areas continue laterally and nearly throughout the venter; a grayish area on each lateral side of the abdomen extends backward from the base to nearly opposite the dorsal hump.

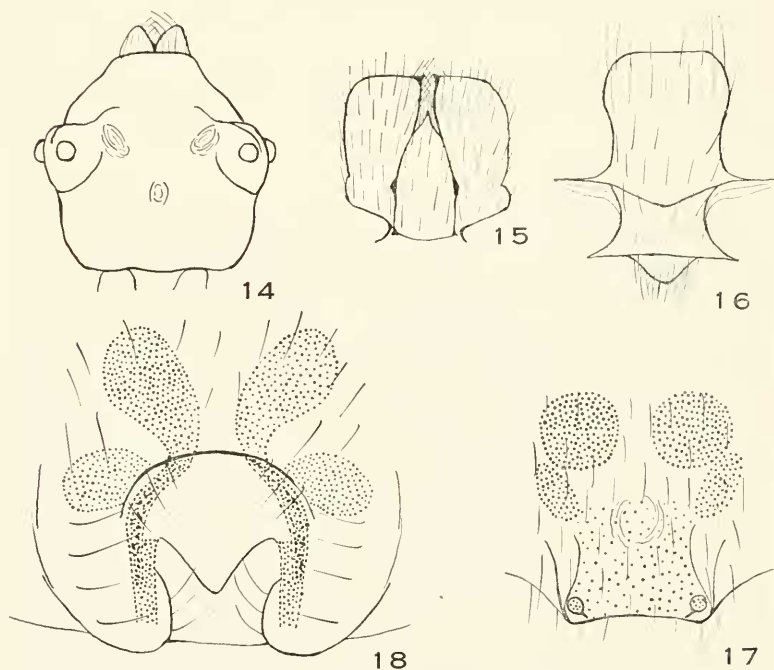
Records. The male is not known and there are no female paratypes.

MAGRAMMOPES LARUNDUS sp. nov.

Figures 14-17

Holotype. The female is from Barro Colorado Island, Panama Canal Zone, August, 1950. The name of the species is an arbitrary combination of letters.

Description. Total length from anterior border of extended chelicerae to posterior end of spinnerets 4.92 mm. Carapace 1.23 mm long; 1.32 mm wide at level of lateral ocular tubercles where it is widest; 0.45 mm tall at level of eyes where it is tallest; with grooves and depressions well developed (Fig. 14); depressions medial to ME deep and conspicuous; division and course of grooves around ocular regions somewhat complicated; median thoracic fovea hardly discernible; with a fairly well developed coat of short hair directed forward. Eyes: four as usual, in a slightly procurved row as seen from above; ratio of eyes ME : LE = 10 : 11; ME separated from



Figures. 14-17. *Miagrammopes larundus* sp. nov. Fig. 14. Carapace, dorsal view. Fig. 15. Maxillae and lip. Fig. 16. Sternum, seen from below. Fig. 17. Epigynum, seen from below. Fig. 18. *Miagrammopes latens* Bryant. Epigynum, seen from below.

one another by nearly nine times their diameter; separated from LE by about 1.3 times their diameter; with black pigment nearly covering the ocular tubercles. Chelicerae: apparently typical of females of the genus. Maxillae, lip and sternum with features as shown in Figures 15-16. Legs: tibial index of first leg 10, of fourth leg 9; calamistrum as usual in females of the genus; fourth metatarsus and tarsus with the short, stout spines similar to those figured for *M. simus* Chamberlin and Ivie; first leg nearly twice as long as second leg and nearly three times as long as third leg. Abdomen without a dorsal, medial swelling such as frequently occurs in females of the genus; otherwise typical of females of the genus and without noteworthy features. Epigynum: obscurely distinctive; observable features shown in Figure 17. Color in alcohol: carapace with most of dorsum light yellowish brown but with numerous gray streaks and spots; lateral areas gray with considerable black pigment in ocular regions; sternum light grayish with a yellowish median stripe; mouth parts generally yellowish with a few grayish spots; legs generally brownish. Abdomen with a conglomerate color pattern; anterior two-thirds of dorsum yellowish, irregularly reticulated and with two pairs of irregularly shaped darker, oblique spots; posterior end of abdomen irregularly brown; lateral sides with several long, narrow, alternating, irregular light and dark lines; venter brownish with a series of stripes leading from genital groove to near the posterior end; there is a narrow, indefinite, brownish, central stripe, a pair of pale, narrow stripes, a pair of broader brownish stripes, and a pair of light lines most lateral of all.

Records. A female collected on May 5, 1964, in the type locality appears to be a paratype; an immature male and an immature female also collected in the type locality at about the same time probably belong to this species.

MIAGRAMMOPES LATENS Bryant

Figure 18

Miagrammopes latens Bryant, 1936: 326, pl. 23, fig. 4. The holotype male is in the Museum of Comparative Zoology; it was taken in Cuba, Sierra del Cobre, Loma del Gato. Bryant, 1940: 330; 1948: 393; Roewer, 1954: 1350; Bonnet, 1957: 2831.

The holotype male is from the mountains of Cuba; the palp is still in good condition and well represented by Miss Bryant's plate 23, figure 4. I have not been able to find the specimen regarded by Miss Bryant as the allotype but I have studied a female from the same locality and, apparently, taken with the allotype. My Figure

18 is taken from this specimen. I see the epigynum somewhat differently than represented by Miss Bryant's figure 98 (1940); I have noted, however, considerable variation in the appearance of this organ among available specimens assigned to this species. The matter will probably not be clarified until numerous specimens are available for study following extensive collecting in the regions where the species occurs.

MIAGRAMMOPES LICINUS sp. nov.

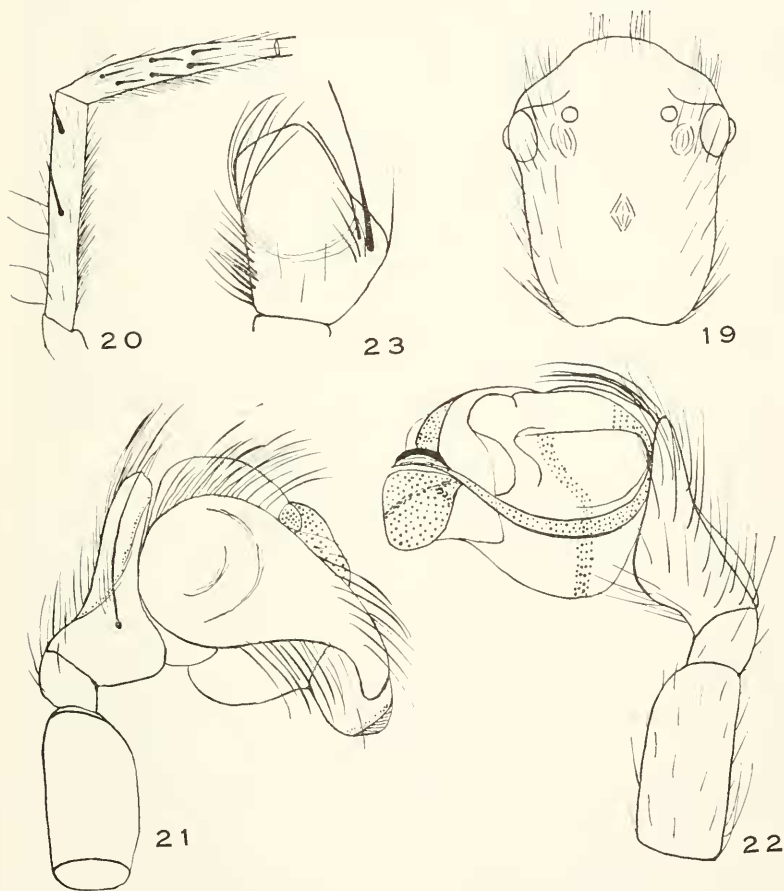
Figures 19-23

Holotype. The male is from El Volcan, Panama, August 14, 1950. The name of the species is an arbitrary combination of letters.

Description. Total length from anterior border of slightly porrect chelicerae to posterior end of spinnerets 3.32 mm. Carapace 1.19 mm long; 0.84 mm wide at level of ocular tubercles; 0.48 mm tall; ocular tubercles quite well delineated by grooves; with a fairly well defined median thoracic fovea; with a pair of depressions shortly behind ME; with a fairly well developed coat of hair which appears whitish in the light used for description (Fig. 19). Eyes: four as usual, in a gently recurved row as seen from above; ME separated from one another by seven times their diameter, from LE by slightly more than four times their diameter; ratio of eyes ME : LE = 5 : 7. Chelicerae, maxillae and lip: all apparently typical of males of the genus. Sternum: extremely convex in the middle; fourth coxae contiguous. Legs: tibial index of first leg 12, of fourth leg 13; first tibia with few spines (Fig. 20) and with different numbers on right and left; first metatarsus with spines as shown in Figure 20; first leg slightly more than twice as long as second leg and nearly three times as long as third leg; the calamistrum is lacking but the fourth metatarsus and tarsus bear several robust, ventral spines similar to those which occur on females; tarsal claws as usual. Palp: general features shown in Figures 21-23; the tibia is very distinctive with its dorsal expansion and concavity; copiously supplied with slender spines; tarsus complicated with its parts difficult to distinguish. Abdomen: without special features; apparently typical of males of the genus. Color in alcohol; carapace with a yellowish, median, longitudinal stripe about one-third as wide as this part of the body; this yellowish stripe contains a narrow, grayish stripe which widens near the middle into an irregular diamond-shaped figure; a broad dark gray stripe covers the remainder of the carapace on each side; sternum yellowish; abdomen with a fairly broad,

grayish, central, dorsal stripe indented along two-thirds of its length and then irregularly broken into a series of five or six somewhat separate spots; on each side of this central stripe there is a yellowish stripe; lateral sides of abdomen irregularly dark grayish; the venter has a grayish central stripe and on each side a narrow, light yellowish stripe and a narrow, darker stripe; all five of these ventral stripes are quite inconspicuous; legs in general yellowish; first pair with considerable dark gray coloration on dorsal and prolateral surfaces.

Records. The female is unknown and there are no paratypes.



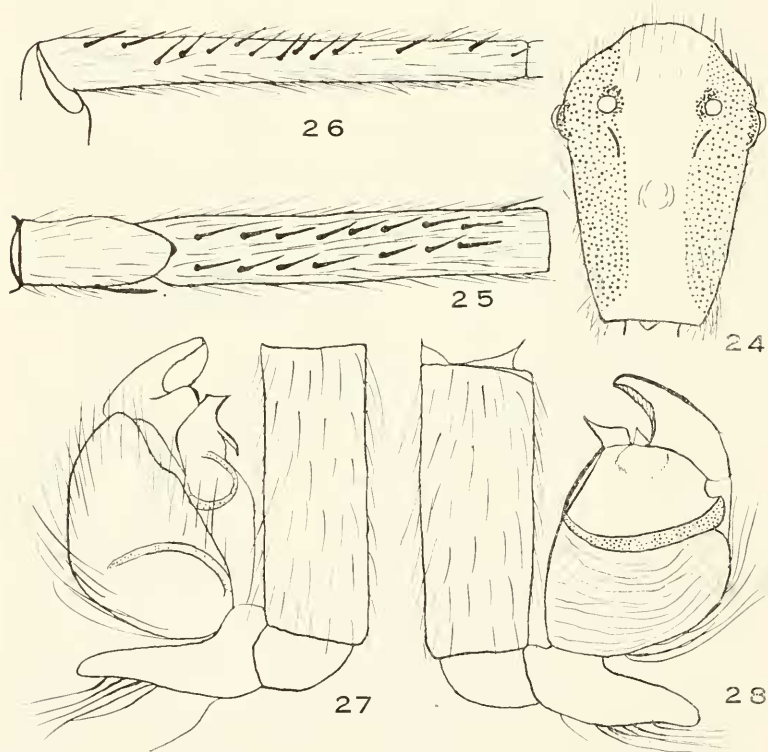
Figures 19-23. *Miagrammopes licinus* sp. nov. Fig. 19. Carapace, dorsal view. Fig. 20. Right first tibia and metatarsus; retrolateral view. Figs. 21-22. Left palp; prolateral and retrolateral views, respectively. Fig. 23. Left palpal tibia; dorsal view.

MIAGRAMMOPES MOLITUS sp. nov.

Figures 24-28

Holotype. The male is from Jamaica, W. I., Portland Parish, Hardwar Gap, October 2, 1957. The name of the species is an arbitrary combination of letters.

Description. Total length about 3.15 mm (body curled closely). Carapace 1.17 mm long; 0.81 mm wide at level of lateral ocular tubercles; about 0.44 mm tall at level of median eyes where it is tallest; with median thoracic fovea barely indicated; with grooves in ocular region very obscure (Fig. 24). Eyes: four as usual with row gently recurved; ratio of eyes ME : LE = 6 : 7; ME separated from



Figures 24-28. *Miagrammopes molitus* sp. nov. Fig. 24. Carapace, dorsal view. Fig. 25. Left first tibia and patella; dorsal view. Fig. 26. Left first metatarsus; prolateral view. Figs. 27-28. Left male palp; prolateral and retrolateral views, respectively.

one another by slightly more than five times their diameter, from LE by about 3.3 times their diameter; with only a moderate amount of black pigment around eyes. Chelicerae, maxillae, lip and sternum impossible to observe clearly because of sharply curled position of holotype and its fragility. Legs: tibial index of first leg 11, of fourth leg 10; first leg with a series of spines on tibia and metatarsus as shown in Figures 25-26; these spines are less robust and have a different placement than in other species treated in this study; other legs with few or no spines but with a copious hair covering; no true fringes observed; first legs considerably more than twice as long as second legs, three times as long as third legs and 1.7 times as long as fourth legs. Palp: complicated; parts difficult to observe because of transparency; form essentially as shown in Figures 27-28. Abdomen: apparently quite typical of males of the genus. Color in alcohol; carapace with a broad, yellowish, median stripe extending the whole length of this part of the body and occupying the middle third; lateral thirds of the carapace grayish brown; sternum yellowish; legs in general yellowish but first legs somewhat grayish brown along dorsal surfaces; abdomen with a median, dorsal, yellowish, longitudinal stripe and a narrower grayish stripe on each side; remainder of the abdomen yellowish with variations.

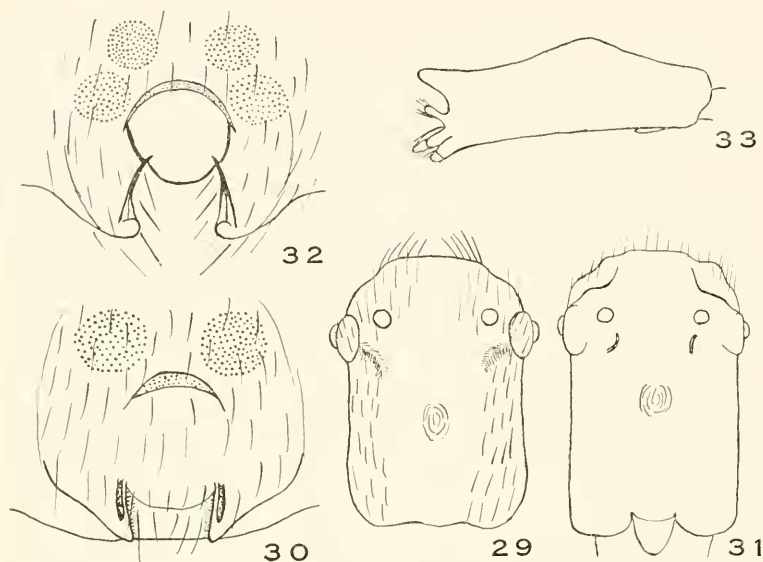
Records. The female is unknown; there are no male paratypes; an immature specimen was taken in the same locality and on the same day as the holotype but its identification is uncertain.

MIAGRAMMOPES OBLUCUS sp. nov.

Figures 29-30

Holotype. The female is from Jamaica, Portland Parish, Hardwar Gap, November 22, 1957. The name of the species is an arbitrary combination of letters.

Description. Total length from anterior border of somewhat extended chelicerae to posterior end of spinnerets about 5.57 mm (body considerably curled). Carapace 1.58 mm long; 1.12 mm wide at level of lateral ocular tubercles where it is widest; about 0.55 mm tall; median thoracic fovea barely discernible; with a moderately developed coat of hair (Fig. 29). Eyes: four as usual, in a gently recurved row, seen from above; ratio of eyes ME : LE = 8 : 10; ME separated from one another by nearly 6.25 times their diameter, from LE by about 3.5 times their diameter. Chelicerae, maxillae and lip apparently quite typical of females of the genus. Sternum: essentially as described for *M. simus* Chamberlin and Ivie except that there is an angular distortion at the swollen and



Figures 29-30. *Miagrammopes obfuscus* sp. nov. Fig. 29. Carapace; from above. Fig. 30. Epigynum; seen from below. Figs. 31-33. *Miagrammopes pinopus* sp. nov. Fig. 31. Carapace; dorsal view. Fig. 32. Epigynum; seen from below. Fig. 33. Abdomen; lateral view, right side.

expanded median part; posterior end not clearly visible but appears to terminate in a narrow, rounded point. Legs: tibial index of first leg 12; of fourth leg 8; first leg slightly more than twice as long as second leg, nearly three times as long as third leg and about 1.4 times as long as fourth leg; calamistrum extends over about five-sixths of the length of the fourth metatarsus; first metatarsus with a definite dorsal fringe; fourth metatarsus and tarsus each with a row of short spines on ventrolateral surface essentially as in *M. simus* Chamberlin and Ivie (Fig. 40). Abdomen: robust, with a slight swelling a little in front of the middle; otherwise quite typical of females of the genus as observed in this study. Epigynum: somewhat obscure; essential observed features shown in Figure 30. Color in alcohol: carapace generally grayish brown; with a lighter, median, irregular stripe extending the entire length of this part of the body; the lateral thirds darker and with a narrow, marginal white stripe. Sternum light yellowish brown. Mouth parts yellowish with variations; the lip is largely grayish. Legs: yellowish in general; first and

second legs with dorsal and dorsolateral surfaces dark grayish brown; fourth metatarsus dark dorsally and prolaterally. Abdomen: with a central, dorsal, very irregular brownish gray stripe flanked on each side by a lighter, irregular stripe; a pair of black dots is present on the dorsum somewhat in front of the middle, and another pair of black dots occurs just behind the middle; lateral sides irregularly brownish; the venter is a kind of light, reddish brown with a narrow, central stripe flanked on each side by a narrow lighter stripe; two pairs of black dots appear in the posterior half of the venter.

Records. The male is unknown. One female was taken on the same day and in the same general locality as the holotype and is tentatively regarded as a paratype, but there are differences which may be due to immaturity.

MIAGRAMMOPES PINOPUS sp. nov.

Figures 31-33

Holotype. The female is from St. John, U. S. Virgin Islands, Centerline Road, 4 miles east of Cruz Bay, March 4, 1964. The name of the species is an arbitrary combination of letters.

Description. Total length from anterior border of extended chelicerae to posterior end of extended abdomen 6.9 mm. Carapace: 1.76 mm long; 1.07 mm wide at level of lateral ocular tubercles; about 0.55 mm tall; with grooves in ocular region only moderately developed; with median thoracic fovea shallow and inconspicuous (Fig. 31). Eyes: four as usual, in a gently recurved row; ratio of eyes ME : LE = 6.5 : 7; ME separated from one another by about seven times their diameter, from LE by slightly more than half that distance. Chelicerae and maxillae apparently typical of females of the genus. Lip: long, slender, convex; widest just before the middle; distal end a fine point. Sternum: long, slender, except for excessive width between second and third coxae; narrowest between first and second coxae; posterior end very hairy, somewhat tuberculate, rounded and ending just opposite bases of fourth coxae, which are separated by a little more than one-third of their width. Legs: tibial index of first leg 11, of fourth leg 7; first leg slightly more than twice as long as second leg, somewhat less than three times as long as third leg, and about 1.4 times as long as fourth leg; all tarsi with claws as usual; calamistrum as usual in females of the genus; fourth metatarsus and tarsus with spines essentially as shown in Figure 40 for *M. simus* Chamberlin and Ivie; other spines seem to be lacking on legs. Palp: with well developed claw and with about five long, slender teeth. Abdomen: moderately raised dorsally; with posterior

end continued into a definite caudal extension above anal tubercle (Fig. 33) and spinnerets; otherwise typical of females of the genus. Epigynum: essential features shown in Figure 32; quite distinctive; resembles that of *M. latens* Bryant. Color in alcohol: carapace grayish brown with many narrow, darker, irregular lines and spots and with lateral sides somewhat lighter; sternum yellowish brown; legs generally yellowish with first pair gray on dorsal surfaces; mouth parts yellowish. Abdomen: light yellowish in general; very reticulate; with a grayish brown, broken stripe along the median dorsal region and with lateral regions bearing irregular and poorly defined, darker, oblique bands; venter highly reticulate and with a pair of very narrow, dark stripes extending from epigynum to the vicinity of the cribellum.

Records. The male is unknown; there are no female paratypes.

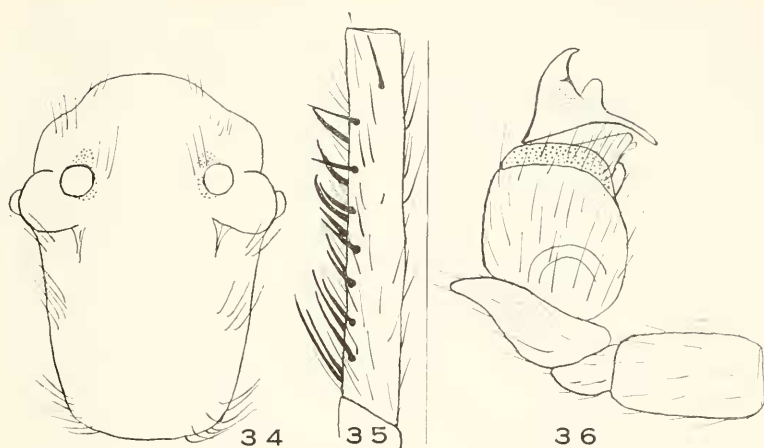
MIAGRAMMOPES SCOPARIUS Simon

Figures 34-36

Miagrammopes scoparius Simon, 1891: 555. The types, male and female, are in the British Museum (Natural History) and were taken on St. Vincent, B.W.I. Simon, 1892: 220; Petrunkevitch, 1911: 97; 1930: 232; Lutz, 1915: 79; Roewer, 1954: 1350; Bonnet, 1957: 2831.

Lutz (1915) reported this species from Puerto Rico, but this is now regarded as an error in identification and, apparently, the species is known only from the type locality. No figures were published with the original description, but in 1902 Simon published a figure of the male palp (fig. 164). Through the courtesy of the Department of Zoology, British Museum (Natural History), I have been able to examine eight specimens from St. Vincent. Three of these are males and one of them has been selected for brief description as given below. The five females all appear to be in various stages of immaturity and, for this reason, no detailed description has been prepared.

Male. Total length about 3.2 mm (body somewhat curled). Carapace 1.1 mm long; 0.79 mm wide at level of LE; general appearance as shown in Figure 34. Simon gave length of male as 4.5 mm. Eyes: four as usual, in a recurved row as seen from above; ME separated from one another by 4.6 times their diameter, separated from LE by about 2.25 times their diameter; ratio of eyes $ME : LE = 7 : 8$. Chelicerae, maxillae, lip and sternum apparently all typical of males of the genus. Legs: 1423 in order of length; first leg more than twice as long as second leg, more than three times as long as third leg but a little less than twice as long as



Figures 34-36. *Miagrammopes scoparius* Simon. Fig. 34. Carapace of male from above. Fig. 35. First right tibia; retrolateral view. Fig. 36. Left palpus of male; prolateral view.

fourth leg. Tibial index of first leg 11, of fourth leg 9. First tibia with a conspicuous battery of robust spines (Fig. 35). Calamistrum lacking; present in immature male. Palp: essential features shown in Figure 36. Abdomen: typical of the genus; without unusual features. Color in alcohol: carapace light yellowish brown in general, somewhat lighter in middle of anterior half; whole area irregularly reticulated with fine dark lines; legs yellowish in general with variations; first leg grayish dorsally; abdomen yellowish through the center and grayish along lateral sides with venter yellowish.

Females. As already indicated, the five females accompanying the males seem to be immature with no developed epigyna. Their general appearance agrees quite well with that of the males. The largest female has a total length of about 4.22 mm (Simon gave length of female as 6 mm).

MIAGRAMMOPES SIMUS Chamberlin and Ivie

Figures 37-44

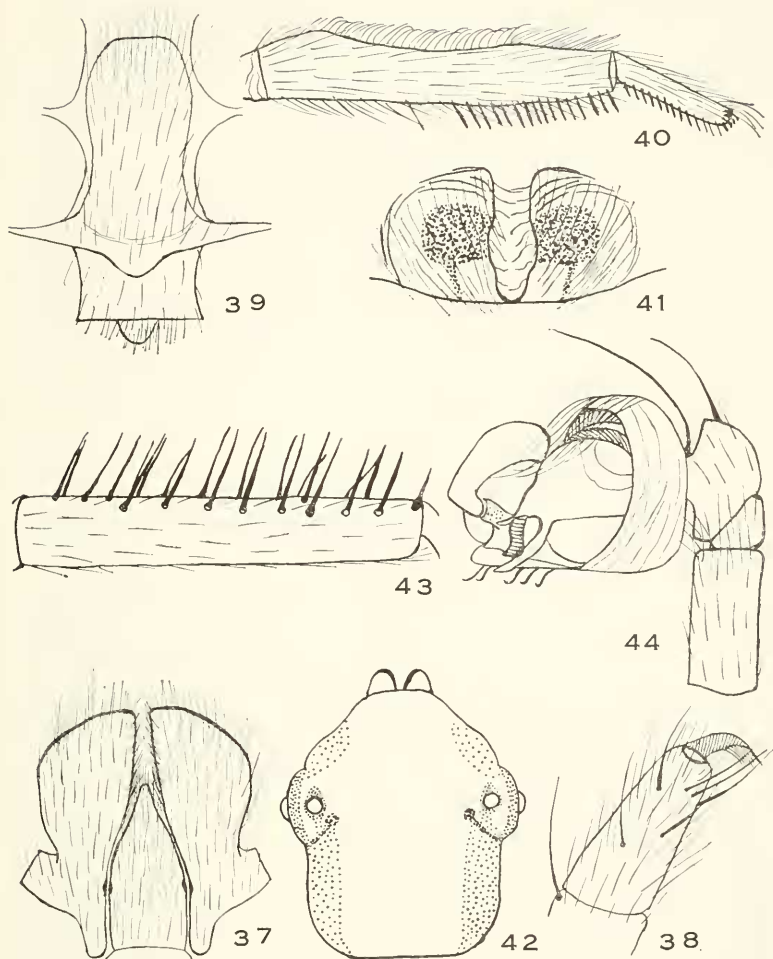
Miagrammopes simus Chamberlin and Ivie, 1936: 12, pl. 2, figs. 11-12.

The female holotype from Barro Colorado Island, Panama Canal Zone, is probably in the University of Utah. Roewer, 1954: 1350; Bonnet, 1957: 2832.

Miagrammopes alboguttatus, — Banks, 1929: 89. (Not *M. alboguttatus* F. P.-Cambridge.)

I have examined the specimens identified as *M. alboguttatus* F. P.-Cambridge by Mr. Banks and am convinced that they are *M. simus*. Because the original description of the holotype female is so brief I have thought it worth while to offer a more detailed description of a selected female from the locality where I collected the original specimen and loaned it to the senior author. It is difficult to match males and females in this genus but I believe I have done so in this case. A male has also been selected and described in the following pages. Males and females are by far the most numerous of any species of the genus in my collection.

Female. Total length from anterior border of somewhat porrect chelicerae to posterior end of posterior spinnerets 6.63 mm. Carapace about 1.76 mm long; 1.41 mm wide at level of lateral ocular tubercles where it is widest; with a conspicuous pair of depressions slightly behind and somewhat medial to ME; with these depressions continued to the lateral margins by grooves in a slightly diagonal direction; with width only slightly narrowed to posterior margin; medial thoracic fovea short and slightly procurved. Eyes: four as usual, in a slightly procurved row, viewed from above; ratio of eyes ME : LE = 10 : 13; ME separated from one another by slightly less than nine times their diameter, from LE by about 1.6 times their diameter. Chelicerae: removal of these organs seems to show that the promargin of the fang groove has a single tooth and several minute cusps each with a stout, long hair; the retromargin of the fang groove appears to have a series of minute cusps each also with a stiff hair. Maxillae and lip: apparently quite typical of females of the genus (Fig. 37). Palpal tarsus with a robust claw having four or five very slender teeth (Fig. 38). Sternum: very angular; swollen near middle where a conspicuous shelf crosses from interval between second and third coxae; slopes sharply from high region both anteriorly and posteriorly; a second less conspicuous shelf crosses the sternum between third and fourth coxae; posterior end obscure but not extended between fourth coxae which are separated by about one-third of their width (Fig. 39). Legs: tibial index of first and fourth legs 10; all tarsi short; first tarsus slightly more than one-fifth as long as first metatarsus; all legs with fine hair; first tibia with a fringe of fairly long hair; apparently three true claws with several spurious claws on each tarsus; spines on fourth metatarsus and tarsus as shown in Figure 40; trichobothria appear to be present on femora, tibiae and metatarsi; the calamistrum extends over about seven-twelfths of length of fourth metatarsus; first leg nearly 3.5 times as long as third leg. Abdomen: essentially as shown in dorsal



Figures 37-44. *Miagrammopes simus* Chamberlin and Ivie. Fig. 37. Female maxillae and lip. Fig. 38. Female left palpal tarsus; prolateral view (with aid from dissected specimen). Fig. 39. Female sternum; seen from below. Fig. 40. Right fourth metatarsus and tarsus of female; retrolateral view. Fig. 41. Epigynum from below. Fig. 42. Carapace of male from above. Fig. 43. First tibia of male; retrolateral view (a few spines restored from scars). Fig. 44. Left palp of male; retrolateral view.

view in figure 11 of Chamberlin and Ivie, 1936; cribellum entire; spinnerets six as usual. Epigynum: somewhat obscured by hair; essential features shown in Figure 41 (variations in appearance have been noted among numerous specimens assigned to this species). Color in alcohol: legs generally brown with variations; first pair darkest of all but with tarsus light yellowish brown and metatarsus somewhat darker; carapace light yellowish brown throughout the dorsal region and with lateral sides dark brown; sternum yellowish brown with variations. Abdomen: with a semi-transparent cardiac area and white spotted area posterior to cardiac region; a pair of irregular, white stripes extend along the dorsum nearly the entire length; lateral regions brownish with an irregular white spot a little in front of the middle; venter light yellowish brown with some variation. Considerable variation in color pattern has been noted among the numerous specimens of this species now in the collection.

Male. Total length from anterior border of slightly porrect chelicerae to posterior end of abdomen about 3.05 mm (body curled and difficult to measure accurately). Carapace 1.06 mm long; 0.99 mm wide at level of lateral ocular tubercles; narrowed to 0.84 mm just behind ocular tubercles; pits and diagonal grooves, so conspicuous in the female, are here much less prominent; general appearance shown in Figure 42. Eyes: four as in female, in a straight row as seen from above; ME separated from one another by 8.5 times their diameter, from LE by about twice their diameter; ratio of eyes ME : LE = 7 : 10; lateral eyes directed somewhat ventrally. Chelicerae, maxillae and lip apparently as in female except for great reduction in size; details hidden by curled position and interlaced legs which are too fragile for disentanglement. Sternum: greatly swollen in middle but lacks the conspicuous transverse folds seen so clearly in the female; fourth coxae almost contiguous. Legs: tibial index of first leg 12, of fourth leg 11; calamistrum apparently lacking; first leg more than twice as long as second leg and nearly three times as long as third leg; first tibia with a battery of nearly two dozen robust spines on dorsal and dorsolateral sides essentially as shown in Figure 43; few spines observed elsewhere and the most conspicuous of these are on the first metatarsus. Palp: with femur, patella and tibia short and without special features; tarsus complicated and distinctive (Fig. 44). Abdomen: without noteworthy features; typical of males of the genus. Color in alcohol: in general light yellowish with variations; carapace with a somewhat angular, nearly white, central dorsal spot, with remainder of dorsum yellowish and with lateral sides grayish and with considerable black pigment in ocular region; sternum grayish; abdomen with dorsum light

yellowish with numerous white flecks; a broken, grayish stripe extends along each side of abdomen and the venter is irregularly grayish. Legs are yellowish in general but with variations; first legs with femora grayish retrolaterally; first tibiae, metatarsi and tarsi are all yellowish brown; other legs with grayish spots.

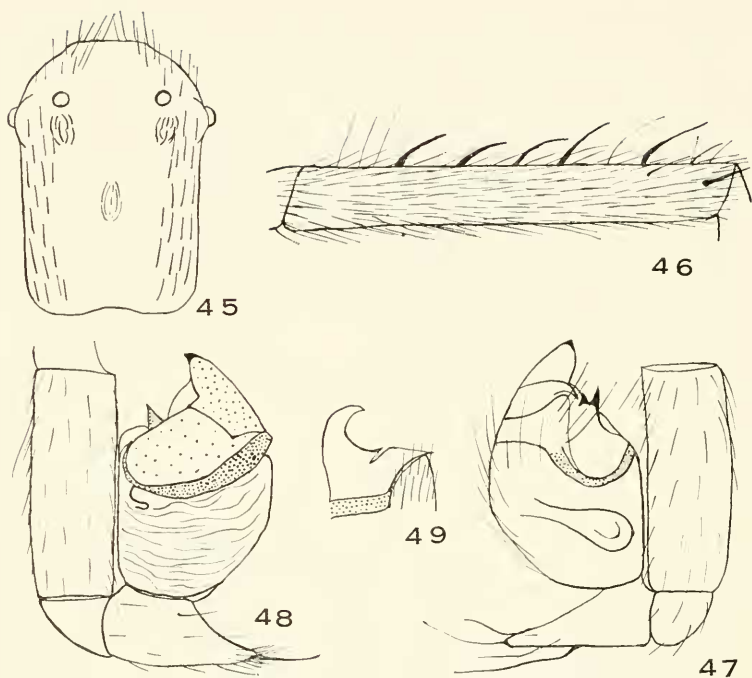
Records. Specimens assigned to this species have been collected on Barro Colorado Island, Panama Canal Zone, during each of my several periods of field work there beginning in 1934; I have a few records of the species from other localities in the Canal Zone and in Panama proper. The described female is from Barro Colorado Island, Canal Zone, May 18, 1964; the described male is from the same locality, August 2, 1954.

MIAGRAMMOPES TONATUS sp. nov.

Figures 45-49

Holotype. The male is from Jamaica, W. I., St. Andrew Parish, Mt. James at Plaintrain River, October 24, 1957. The name of the species is an arbitrary combination of letters.

Description. Total length 3.45 mm. Carapace 1.08 mm long; 0.79 mm wide at level of lateral ocular tubercles; not conspicuously grooved as in some species in the genus; depressions just posterior to ME only moderately developed; median thoracic fovea only moderately depressed (Fig. 45). Eyes: four as usual, in a moderately recurved row, seen from above; ratio of eyes ME : LE = 5 : 6; ME separated from one another by about 6.5 times their diameter, from LE by slightly more than four times their diameter; lateral ocular tubercles only moderately developed. Chelicerae, maxillae and lip apparently quite typical of males of the genus. Sternum: with the usual form in this genus; greatly swollen, widened and extended between second and third coxae. Legs: tibial index of first leg 11, of fourth leg 8; calamistrum apparently lacking; first tibiae and metatarsi with few conspicuous, erect spines, others horizontal and hidden by hairs (Fig. 46); first leg more than twice as long as second leg, nearly twice as long as fourth leg and about three times as long as third leg; tarsal claws as usual; several trichobothria observed on tibiae and other segments. Palp: very short as usual; essential features shown in Figures 47-49. Abdomen apparently typical of males of the genus. Color in alcohol: carapace generally a dark gray with lighter spots and darker, irregular lines together with a dull, yellowish, ventral margin; sternum dark gray, lighter at anterior end; first pair of legs light yellowish brown ventrally, darker gray elsewhere except for tarsus which is yellowish brown;



Figures 45-49. *Miagrammopes tonatus* sp. nov. Fig. 45. Carapace of male from above. Fig. 46. First right tibia; retrolateral view. Figs. 47-48. Male palp; retrolateral and prolateral views, respectively. Fig. 49. Tip of tarsal bulb; nearly dorsal view.

legs 2-4 much as first but less conspicuously so; mouth parts yellowish with grayish streaks. Abdomen: with a somewhat indented, dark gray, median stripe extending from base for about three-fourths of length of abdomen and then joining a darker area which covers the posterior quarter of the dorsum; lateral to this median region are lighter areas with irregular, yellowish white spots; venter with a central, light, reticular stripe extending from genital groove to posterior end; on each side of this central stripe there is a narrow, irregular, semitransparent stripe and further laterally are reticulated areas; entire color pattern indefinite and difficult to describe adequately.

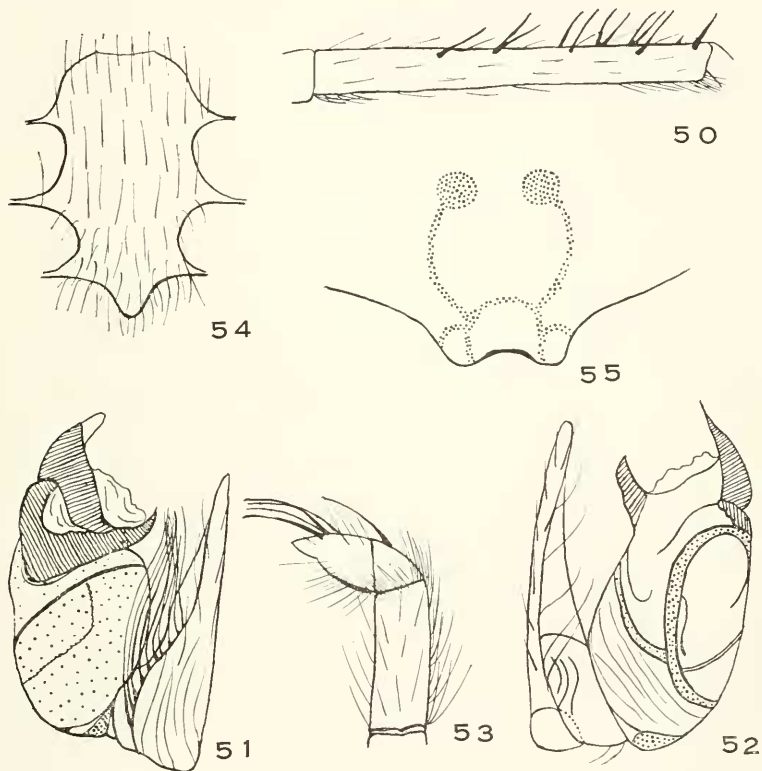
Records. An immature male taken with the holotype appears to belong to this species. The female is unknown.

MIAGRAMMOPES UNIPUS sp. nov.

Figures 50-55

Holotype. The male is from Barro Colorado Island, Panama Canal Zone, June, 1950. The name of the species is an arbitrary combination of letters.

Description. Total length from anterior border of chelicerae to posterior end of spinnerets 3.58 mm. Carapace 1.06 mm long; 1.0 mm wide at level of lateral ocular tubercles; about 0.4 mm tall; with general form essentially as in *M. simus* Chamberlin and Ivie



Figures 50-55. *Miagrammopes unipus* sp. nov. Fig. 50. Right first tibia of male; retrolateral view. Figs. 51-52. Left palpal tarsus of male; prolateral and retrolateral views, respectively. Fig. 53. Left palpal femur, patella and tibia; retrolateral view (from male paratype). Fig. 54. Sternum of described female paratype; seen from below. Fig. 55. Epigynum; seen from below.

with depressions medial to ME moderately conspicuous but grooves leading to lateral border almost lacking. Eyes: four as usual, in a gently procurved row as seen from above; ME separated from one another by about eight times their diameter, from LE by slightly more than their diameter; ratio of eyes ME : LE = 8 : 10.5. Chelicerae: short and largely hidden by elongated maxillae which are twice as long as lip; all of these parts hidden by fragile surrounding structures. Sternum: elongated, narrow, quite convex opposite second coxae; continued laterally between second and third coxae; obtusely terminated between bases of fourth coxae but not continued between the latter, which are separated by about one-fifth of their width. Legs: tibial index of first leg 10, of fourth leg 7; first leg nearly three times as long as third leg; second leg only a little shorter than fourth leg; first tibia with a set of robust spines (Fig. 50); first metatarsus with fewer and less robust spines; tarsal claws as usual in the genus. Palp: distinctive features shown in Figures 51-53; femur of moderate length; patella and tibia extremely short. Abdomen: considerably flattened dorsally; otherwise typical of males of the genus. Color in alcohol: carapace with a narrow, central, somewhat broken grayish stripe; with considerable black pigment in ocular area; with a broad, lateral, grayish stripe on each side from lateral eyes to posterior border; the lower part of this gray stripe becomes lighter, thus adding another stripe to the lateral sides and, finally, the ventral margin is darker gray, thus making a total of seven distinguishable stripes on this part of the body; sternum yellowish with fairly broad, grayish margins. Abdomen: yellowish dorsally with two pairs of narrow, elongated, grayish spots dorsolateral in position and a series of small grayish spots at posterior end above spinnerets; laterally there are several short, grayish stripes; the venter has a narrow, median, grayish stripe with a narrow yellowish stripe on each side, and further laterally is a broader, light grayish stripe on each side; shortly in front of the reduced cribellum there is a narrow, grayish, transverse bar. Legs yellowish in general with several grayish spots and whole segments; fourth legs with most conspicuous grayish parts; fourth patellae dark gray; distal parts of fourth tibiae the same and nearly the entire metatarsi are gray.

Female paratype. The described female paratype measures 5.2 mm from anterior border of carapace to posterior end of spinnerets; length from anterior border of somewhat extended chelicerae to posterior end of spinnerets about 5.59 mm. Carapace 1.3 mm long; 1.32 mm wide at level of lateral ocular tubercles; medial to ME there is a fairly conspicuous depression in communication with a

narrow groove which extends along the border of the ocular tubercle to the lateral border of the carapace; another narrow groove in front of the ocular tubercle passes to the lateral border of the carapace and is connected to a short, narrow groove extending about half way through the tubercle between ME and LE; otherwise apparently typical of females of the genus. Chelicerae hidden and not clearly visible. Maxillae long, parallel, with rounded lateral borders. Lip: about three-fifths as long as maxillae; central portion swollen; sternal suture may not be a movable joint. Sternum: only moderately convex; not conspicuously swollen as in most females of the genus seen in this study; not extended between fourth coxae which are separated by nearly one-fourth of their width (Fig. 54). Legs: tibial index of first leg 10. of fourth leg 9; first leg twice as long as second leg and more than three times as long as third leg; fourth leg about 0.7 as long as first leg; spines appear to be lacking except for the moderately developed set of robust spines on fourth metatarsus and tarsus similar to those shown in Figure 40; legs with a fairly well developed coat of hair and first metatarsus has a moderately well developed ventral fringe; calamistrum appears typical of females of the genus. Abdomen: with a pronounced dorsal medial swelling; quite typical of females of the genus. Epigynum: obscure and difficult to observe clearly; observed essentials shown in Figure 55; a dorsal injury to the abdomen has permitted eggs to extrude, thus indicating that the female is nearly or quite mature. Color in alcohol: essentially as in male holotype except that the gray parts in that sex are here all considerably extended and blackened.

Records. The described female paratype was taken on Barro Colorado Island, Panama Canal Zone, August 22, 1939. Several male paratypes are in the collection from the type locality and taken as follows: August, 1936, 1950; July, 1939, 1950, 1954; February, 1958. One male paratype was taken at Summit, Panama Canal Zone, July, 1950. Three additional females are, with some uncertainty, placed in this species and were taken as follows: July, 1934; August, 1939; May, 1964, all from Barro Colorado Island, Canal Zone.

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